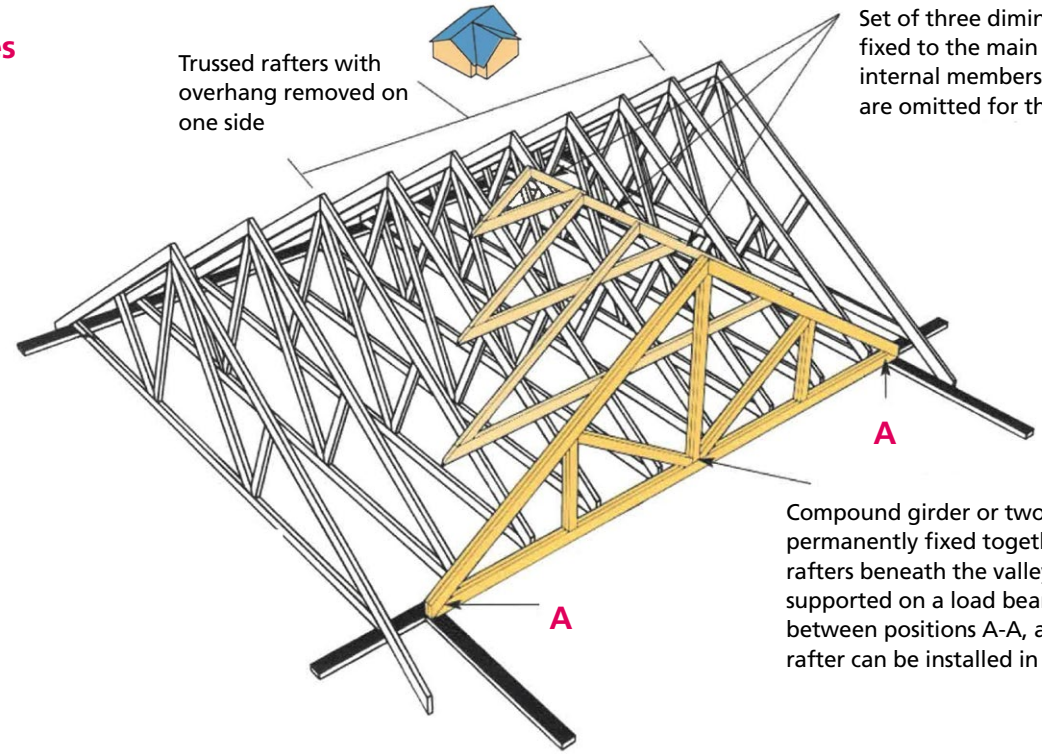
Fixing valley trusses - diminishing trussed rafters

In order to create a change of direction or a feature gable within a trussed rafter roof structure there will be an area of the roof which is formed on top of the main supporting trussed rafters. These additional elements are called valley trusses, valley frames or diminishing trussed rafters and their function is to transfer the tile and other loading uniformly to the top chord of the underlying trussed rafters.

Valley trusses



Set of three diminishing valley trusses fixed to the main trussed rafters. The internal members of the valley trusses are omitted for the sake of clarity.

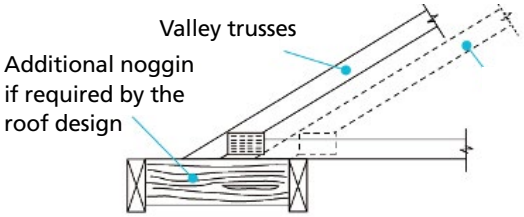
Compound girder or two trussed rafters permanently fixed together. If the trussed rafters beneath the valley frames are supported on a load bearing wall or beam between positions A-A, a single ply trussed rafter can be installed in this location.

Valley trusses are designed to transfer the tile loading uniformly to the top chords of the underlying trussed rafters, and should be used in all cases rather than constructing this area with common infill timber.

In order to transfer the tile load and prevent the valley trusses from slipping down the roof slope effective support is required at each point where the valley truss crosses the top chord of the trussed rafters below. There are three recognized methods to support the connection between the square bottom chord of the valley truss and the sloping top chord of the trussed rafter below. It is not sufficient to make this connection with a square edged longitudinal batten or binder.

Tile battens should continue under the valley set unless the truss drawings state this is not required. The truss designer needs to specifically check the design of the trussed rafters with the top chord restraint centres set at the valley truss centres in order for the tile battens to be excluded.

Where the ends of the valley truss do not finish over a main trussed rafter top chord an additional noggin, if required by the roof design, may be fixed between the main trussed rafters.



MI0006 – 2024/02

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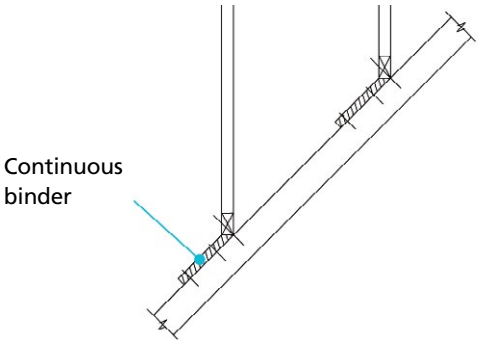
TRUSSED RAFTER ASSOCIATION

Method 1

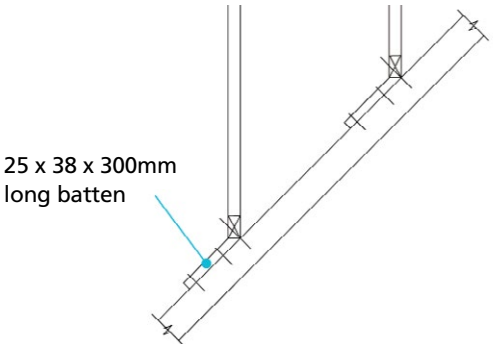
Valley trusses should be skew nailed to each trussed rafter crossed and be supported on a continuous binder fixed across the main trussed rafters. The top edge of the binder should be splayed to suit the square bottom chord of the valley trusses. The binder should be nailed to each trussed rafter crossed with two 3.35mm dia. x 75mm long galvanized wire nails.

Note: As an alternative to the continuous binder on pitches less than 30 degrees a bevelled bottom chord could also be used where the truss manufacturer is able to offer this option.



Method 2

As an alternative to a continuous binder a 25 x 38 x 300mm batten can be fixed, with two 3.35mm dia. x 75mm long galvanised wire nails up each trussed rafter. The top end of each short batten should be splayed to match the bottom chord of the valley trusses.



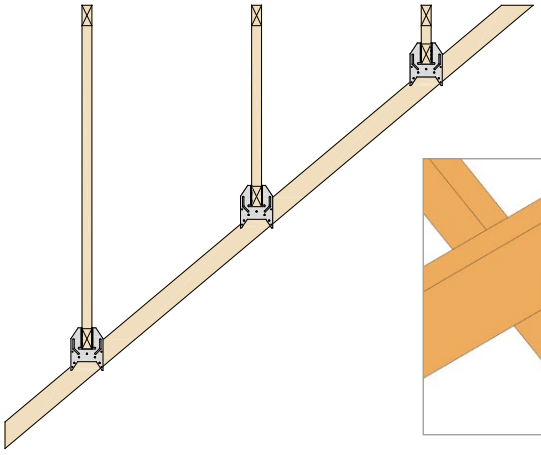
Method 3

Proprietary metalwork in the form of valley truss clips use a tested connection to provide support and effectively transfer the tile load and other necessary uplift and or horizontal forces to the trussed rafters below.

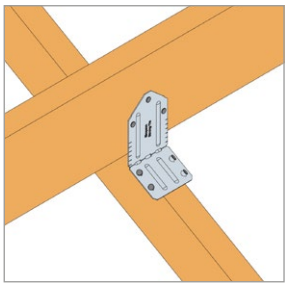
Suitably designed and tested valley truss clips should be installed and fully fixed in accordance with the manufacturers product installation instructions.

Examples of tested valley truss clips:

- **Cullen – Valley Truss Clip Ref – TA-38 & TA-50**
- **Simpson Strong Tie – Valley Truss Clip Ref – VCTR**



Valley clips:
Cullen (left)
Simpson (below)



MI0006 – 2024/02